OBSERVATIONS ON SOME SHRUBBY ADESMIAE OF CENTRAL CHILE

C. Skottsberg

With two text-figures

In the dry chaparral country south of Coquimbo a tall *Adesmia* is one of the predominant shrubs; nevertheless I found some difficulty in naming it, because it did not seem to fit *A. arborea* Bert. ex Colla or *A. microphylla* Hook. & Arn., the shrubby species supposed to occur in this region. A study of the literature and of herbarium specimens showed that there has been and still is some confusion about *A. arborea* and its relatives, which made me look a little closer into the matter. The result is communicated below.

Adesmia arborea of Bertero and of Colla

I quote Colla's description in full (4, p. 58):

"*A. arborea* (Berter. in Merc. Chil. 12. p. 557 sine descriptione); caule frutescente ramisque glanduloso-scabris, foliis fasciculatis 7–10-iugis, foliolis subsessilibus ovato-oblongis ciliatis, pedunculis axillaribus 1-floris folio brevioribus, leguminis longe barbatis (flores flavi)" Nob. Habitat in fruticetis collium apric. *Quillota,* cult. in h. ripul. e seminibus missis ab Auctore; stamina in hac stirpe 5–10, setae leguminum barbato-plumosae versicolores; ergo in sect. I (*Chaetotricha* DC. l. c.) collocanda."

Walpers (11, p. 729) quotes "Mercurio chilense" XII. 559 and Colla's paper. I have not had access to Bertero's original paper, but only to Dr. Ruschenberger's English translation (1), where we find, on p. 67 under *Adesmia*: "The *Palhuen* which I have named *A. arborea,* a pretty shrub which is found in the stony and arid situations about hills approaches the *Zuccagnia punctata*. Cavanilles. Its foliage, the number and color of its flowers, and above all its pods, clothed with very long and different colored hairs, make it interesting in English gardens. The other species are all herbaceous. . . ." From this we may conclude that Bertero recognized only *one* arborescent species. According to Clos (3, p. 196), *Palhuen* is the common name for *A. microphylla* Hook. & Arn., but it is also used for what he describes as *A. arborea,* together with *Espinillo,* which, as we shall see presently, is the name given by Bertero for *A. microphylla,* distributed by him as *A. arborea*.

Whether Colla drew his description from specimens he received or only from those he raised from seeds, I do not know. In Herb. Stockholm is a specimen of Bertero with two labels: (a) testified as written by Bertero:

"*761*[1] *Adesmia arborea Bertero vulgo espinillo. In fruticetis lapidosis collium Quillota (Chile) 1819 8 br. 9 mbr.*"; (b) *Adesmia arborea. microphylla Hook.* (added later). This specimen, which forms part of the type material of *A. arborea* Bert., is *eglandulose,* has 4–6 pairs of obovate-orbicular, very small leaflets, and racemose flowers supported by minute bracts. It cannot have anything to do with Colla's *A. arborea* but it is identical with *A. microphylla* of Hooker & Arnott. To judge from a note (5, p. 55), these authors came to the same result: "Our *Adesmia microphylla* we have received from Mr. Mathews as the *arborea* of Bertero's MSS. But this plant of Bertero M. Guillemin is disposed to refer to *Zuccagnia punctata* of Cavanilles." This, as far as I can see, is an impossible suggestion. Bertero was familiar with Cavanilles' work, and could not very well have mistaken *Zuccagnia punctata,* well described and figured by Cavanilles (2, p. 2, *pl. 403*) for an *Adesmia.* On the other hand, it is easy to show that Bertero's *A. arborea* was a mixture.

Ademsia arborea of Clos and Reiche

Clos (3, p. 192) divides *Adesmia* § V, Plantas frutescentes y espinosas, into two groups: 1. Flores no arracimadas, and 2. Flores dispuestas en rácimos. In group 1 the branches carry numerous more or less semi-globular dwarf shoots with fasciculate leaves surrounding a few axillary flowers; in the second group these shoots, after a few very short internodes, become prolonged, forming a raceme as a rule terminated by a spine. To the first group *A. arborea* Bert. is referred, to the second *A. microphylla.* Clos gives a detailed description of the former, which is a tree, 6–7 feet high, eglandulose in all parts; the branches, which end in 2- or 3-furcate spines, are provided with dwarf shoots in the shape of tubercles carrying leaves and flowers; leaves canescent, with 3 or 4 pairs of small oval leaflets; calyx-teeth narrow, acute, of the same length as the tube. It grows in the provinces of Colchagua and Santiago, north to Coquimbo. Clos adds (p. 195): "Creemos que la *A. arborea* de Colla deberia mas bien unirse á la *A. glutinosa,* puesto que está descrita como glandulosa y nada se dice de sus espinas, que son muy raras en esta última especie." This is, however, not very probable, because *A. glutinosa* belongs to the second group of Clos, while Colla's *A. arborea* falls within the first. Clos continues: "Nuestra planta es por cierto la *A. arborea* de Bertero, de la que tenemos á la vista los ejemplares recojidos y marcados por el mismo." Consequently, Bertero must have distributed two different species under the name of *A. arborea,* one of which is equal to *A. microphylla* Hook. & Arn., the other differing from Colla's *A. arborea* in lacking all glands and in having 3 or 4 pairs of leaflets instead of 7–10. Unfortunately, I have not had an opportunity to examine Colla's type. That *A. arborea* Bert. is a mixture was pointed out by Steudel (10, p. 27). Under *A. microphylla* we find as a synonym "A. arborea. *Bert.* hrb. (ex parte nr. 763 non nr. 5)," whereas no. 5 is

[1] Or *763?*; the last figure is indistinct.

called "A. Berteroniana. *Steud.* A. arborea *Berter* (ex parte nr. 5. non 763)," and under *A. arborea* Bert. we find "A. Berteroniana, microphylla." Colla is not mentioned by Steudel. Index Kewensis retains *A. arborea* Bert. and refers *A. arborea* Colla to *A. glutinosa* Hook. & Arn. without a query.

Philippi (6, p. 48) lists *A. arborea* Bert. Mem. Tor. XXXVII. 59, where, as we have seen, Colla is the author; besides, he identifies an "arborea Colla ubi?" with *A. viscosa* Gill., a very different plant.

Reiche's *Patagonium arboreum* (Bert.) (8, p. 120), "Adesmia arborea Bert. Gay II páj. 194", is identical with Clos' and the description is an abbreviated translation of his. He does not quote Colla, but under *Patagonium glutinosum* (Hook. & Arn.) we find as a synonym "*Medicago arborea* Colla." As far as I am aware, Colla never described such a species. Probably Reiche has copied Philippi (6, p. 49), who puts "Medicago arborea Colla" as a synonym of *A. glutinosa*. The distribution of *A. arborea* is according to Reiche from Coquimbo to Linares, in sterile hills, but not in the littoral zone, but he also lists it from Valparaiso (4, p. 196), rather a doubtful record.

I have seen two collections clearly belonging to *A. arborea* of Clos and Reiche:

(1) "*Adesmia arborea* Bert. Chile centralis, Prov. Colchagua, ad Baños de Cauquenes, 28. VIII. 1896. *P. Dusén*" (S). FIGS. 1, 2.

Morphology as described. Leaves 15–20 mm. long, including the petiolar half of the rachis, rather densely canescent, with 3 or 4 (very rarely 5) pairs of leaflets 2–3 × 1–1.5 mm., these elliptic-obovate, in some cases minutely apiculate. Calyx densely canescent, 4.5–5 mm. long, including teeth of 2–2.5 mm.; standard with a glabrous limb 5–6 × 7–8 mm. and a boat-shaped claw 1.7–2.1 mm. long; wings with limb 5.7–6.1 × 3.5–3.8 mm. and claw 2.4–2.7 mm. long; keel with limb 5–5.2 × 2.8–3.7 mm. and a claw of 2.5–2.7 mm. Stamens apparently anomalous in most flowers. Ovary 5-jointed, densely hirsute along edges, the sides of joints with numerous glandular appendices, becoming greatly lengthened and plumose in the developed pod. Flowers yellow with veins marked with reddish brown.

(2) "*Adesmia arborea* Bert. Nom. vulg. *Palhuén*. Prov. Santiago, alt. 1450 m. X. 1931. *C. Grandjot*." (S). FIGS. 3, 4, 25.

Very like the former. Leaves to 20 mm. long, generally 3- but sometimes 4-jugate, the leaflets linear to linear-spatulate, obtuse and more or less distinctly apiculate, 3–5 × 0.7–1.7 mm., puberulous. Calyx 5–5.5 mm. long including the 2–3 mm. long linear-subulate teeth. Standard as in the former, the limb 4.5–5 × 7.8 mm., the claw 1.7–2 mm. long; limb of wings 4.7 × 3.7 mm., the claw 3.5 mm. long; keel with limb 4.5 × 4 mm., the claw 3 mm. long. Longer stamens 8–8.5 mm. long, the shorter ones 7–7.5 mm. long. Ovary 4- or 5-jointed, as before, the style 6 mm. long. In an envelope is an almost ripe pod, but whether or not it belongs to the specimen I cannot tell. It measures 16 mm. long, with three fertile joints, their flat sides adorned by plumose setae 7–8 mm. long. They are less

numerous than in *A. glutinosa,* so that the pubescent wall of the pod, which is completely hidden in this, is visible.

Adesmia arborea Bert. is a *nomen nudum.* It does not include *A. arborea* Colla, which is a dubious species, but two other species, *A. microphylla* Hook. & Arn. and *A. arborea* in the sense of Clos and Reiche. For the latter we may better take up the name *A. Berteroniana* Steud.

Adesmia microphylla Hook. & Arn. (5, p. 19, *pl. IX*)

A well-defined species, of which I have seen numerous specimens.

Described as a decumbent, intricately branched shrub; the long shoots carry much reduced, tuber-like dwarf shoots with a fascicle of leaves surrounded by the old persistent stipules. Leaves pubescent, as much as 6-jugate, the leaflets very small, orbicular. The dwarf shoots are not represented in the plate, which does not give a good idea of the morphology; the leaves are drawn as 3- or 4-jugate with mostly alternate leaflets, and in many cases they show a terminal leaflet, which I believe never develops. The flowers are borne in terminal racemes ending in a needle-pointed spine, but the plate gives no idea of the complex system of vegetative-floral branches. The short calyx-teeth are quite characteristic of *A. microphylla.* The pod is said to be 3-jointed, but all the pods figured are 4-jointed, and this seems to be the rule.

The type was collected by Menzies at Valparaiso, where *A. microphylla* seems to be common. I have examined the following specimens from the vicinity of Valparaiso:

R. A. Philippi, Pl. chil. no. *390,* Dec. 1851 (S, U); *N. J. Andersson* in 1852 (S); *W. H. Harvey* in 1856 (S); *E. Asplund* no. *3,* July 21, 1921 (S); Zapallar, n. of Valparaiso, *C. Skottsberg,* Sept. 16, 1908 (U); El Salto, n. of Valparaiso, *C. & I. Skottsberg* no. *945,* Aug. 26, 1917; Quillota, e. of Valparaiso, *Bertero* no. *761* (*763?*), in 1819 (S).

According to Reiche (8, p. 131), *A. microphylla* is distributed from Coquimbo province to Santiago and Valparaiso, and (9, p. 184) it is quoted from Frai Jorge in Coquimbo, but the frutescent *Adesmia* growing there belongs to a different species, and the records from Santiago are rather dubious.

The length of the leaves, the size and shape of the leaflets and flower-parts, etc., show a certain variation. A summary of my observations is given below.

Bertero no. *761* (*763?*). Leaves mostly 5-jugate, about 20 mm. long, the leaflets obovate, rarely suborbicular, (0.8–) 1–2 × 0.8–1.1 mm., thinner than in most cases. Calyx 3 mm. long, including teeth of 1 mm. I did not feel justified in sacrificing one of the very few flowers; they look exactly like those of *A. microphylla.*

Philippi no. *390.* Leaves 3- or 4-jugate, 10 mm. long, the leaflets orbicular, 1.2 × 1.2 mm. Calyx 2.5–3 mm. long, the teeth 1–1.3 × 0.8–1 mm. Standard-limb 5.3 × 8, the claw 2.9 mm. long; wing-limb 4.8 × 2.9, the claw 3 mm. long; keel-limb 4.5 × 3.2, the claw 2.5 mm. long; longer stamens 8.2, the shorter ones 5.5 mm. long.

Harvey. Leaves as in the preceding. Calyx 2.8–3 mm., the teeth 0.5–1

mm. long; standard-limb 5.5 × 7, the claw 2.8 mm. long; wing-limb 4.2 × 2.7, the claw 3 mm. long; keel-limb 4 × 3, the claw 3 mm. long; longer stamens 8.5, the shorter ones 6.2 mm. long.

N. J. Andersson. Leaves as above, the leaflets mostly shed, leaving rachis standing. Calyx 3 mm., the teeth 0.5–0.9 mm. long; standard-limb 4 × 6, the claw 2 mm. long; wing-limb 3.5 × 2, the claw 2.5 mm. long; keel-limb 4 × 2.6, the claw 2.5 mm. long; longer stamens 6.5–7, the shorter ones 5.5 mm. long.

Skottsberg, Zapallar. Leaves 10–20 mm. long, 2–5-, generally 3- or 4-jugate, the leaflets suborbicular to orbicular, very obtuse, sometimes slightly emarginate, 1.6–3.2 × 1.8–2.7 mm. Calyx 3–3.5 mm., the teeth 0.7–1 mm. long; standard-limb 9.5 × 10.5–11, the claw 3.5 mm. long; wing-limb 7.5 × 3.4, the claw 4 mm. long; keel-limb 7 × 4.6, the claw 4 mm. long; longer stamens 11, the shorter ones 9.5 mm. long. Figs. 9, 10, 27.

Skottsberg no. *945.* Leaves 3- or 4-jugate, about 10 mm. long, the leaflets broadly ovate to orbicular, 0.9–2 × 0.9–1.5 mm., distinctly (0.2–0.4 mm.) petiolulate. Calyx 2.5–3 mm., the teeth 0.5–0.7 mm. long; standard-limb 5–6 × 7.8–9.5, the claw 2.7 mm. long; wing-limb 4.5–5 × 2.6–2.7, the claw 3–3.5 mm. long; keel-limb 4.2–4.4 × 3.3–3.5, the claw 2.7–3 mm. long; longer stamens 7.3–8.2, the shorter ones 6.3–6.5 mm. long. Figs. 5, 6, 26.

Asplund no. *3* represents exactly the same form as *Skottsberg* no. *945.* Figs. 7, 8.

The specimens from Zapallar differ conspicuously from the rest by their larger leaflets and flowers; leaflets of the same size are also observed in a specimen without locality, date, or name of collector (misit A. de Jussieu, 1834, S): 3- or 4-jugate, the leaflets 1.5–3.2 × 0.9–2 mm.

The ovary is, as a rule, 4-jointed, but it happens that only two or three (in some cases only one) of the joints produce seed. The setae are as much as 9 or 10 mm. long, plumose with a naked base, and the pericarp is clearly visible.

Adesmia glutinosa Hook. & Arn. (5, p. 19)

"Caule fruticoso ramoso, ramulis patentibus glanduloso-hirsutis, glutinosis spinescentibus, foliolis subtrijugis ellipticis hirsutis, racemis elongatis terminalibus simplicibus spinescentibus bracteisque linearibus glanduloso-hirsutis, leguminibus triarticulatis longissime setoso-plumosis.

"Hab. Coquimbo. — This differs from the preceding [*A. microphylla*] in its larger leaflets, longer racemes, narrower bracteae, longer pedicels, and in the viscid glands and patent hairs which clothe all the younger parts of the plant except the corolla."

Through the kindness of the Director at Kew I had occasion to see the type sheet. Framed-in is the top of a branch with a terminal inflorescence in advanced bud stage. There are very few leaves left, 10–12 mm. long, with 3 or 4 pairs of leaflets 2–2.6 × 1–1.5 mm., thick, hirsute especially beneath, and with numerous bottle-shaped glands. Stem and inflorescence, including pedicels and calyx, are covered with the same coarse pubescence and glands. The specimen is labeled "*Beechey's Voy. Adesmia glutinosa Hook. & Arn.*" in W. J. Hooker's hand, and Dr. I. M. Johnston has added

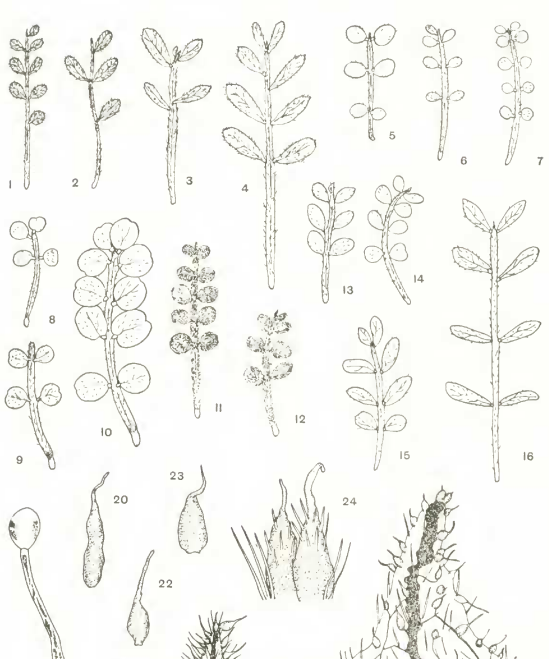

FIG. 1. 1–16. Leaves of *Adesmia* species. *1, 2. A. Berteroniana*, leg. *Dusén*; *3, 4.* id., leg. *Grandjot*. *5, 6. A. microphylla, Skottsberg* no. *945*; *7, 8.* id., *Asplund* no. *3*; *9, 10.* id., leg. *Skottsberg*, Zapallar. *11, 12. A. glutinosa, Werdermann* no. *214*; *13, 14.* id., leg. *Grandjot*. *15, 16. A. Bedwellii, Skottsberg* no. *801*. *17.* Calyx-tooth of *A. glutinosa, Werdermann* no. *214; 18.* id., leg. *Grandjot*. *19.* Secretory gland from calyx of *Werdermann* no. *214*. *20–23.* Very young setae from pod of *A. Bedwellii, Skottsberg* no. *801*. *24.* Slightly older setae from pod of *A. microphylla, Skottsberg* no. *945*. — 1–16 × 2; 17, 18 × 20; 19–24 × 200.

"Type." The collectors are Lay and Collie. Obviously this is not the entire type material, as it lacks pods. The stump is glued to the paper, making a closer examination of the flower impossible. The calyx is about 4.5 mm. long, with acute teeth of about 2 mm.

On the same sheet are samples collected by C. Gay. The label bears in print "Herb. Mus. Paris" and "Amériq. méridl". Chili," and written "Recd. 1864–65. *Adesmia glutinosa Hook. Clos in Gay Fl. Chil. II, 195.*" There are numerous well developed leaves, flowers, and pods, some mature, but this material has not been used for the original description. The cortex of the old branch is dark cinnamon-colored. The leaves are 20–25 mm. long, 4- or 5- or even 6-jugate, hirsute and glandular when young, later glabrescent, with elliptic to slightly obovate, acute to very blunt leaflets averaging 3 mm. in length and 2 mm. in width (2.5–3.5 × 1.3–2.5 mm.). The pubescence and glandulosity of the stem and inflorescence are exactly as in the type, and there can be no doubt that Gay's specimen represents true *A. glutinosa;* Clos' description differs, however, in two points: the leaflets are said to be in 8–6 pairs (in the Spanish description he says 6 or 7) and only 0.5–1 mm. large; otherwise the specimens match the description perfectly. That Hooker and Arnott call the pods 3-jointed and Clos 2–7-jointed is of no importance; they are 4- or 5-jointed in Gay's specimen. It is noteworthy that in certain pods the lowermost joint is naked, whereas in others all are beset with the long, densely hairy setae which form a much thicker cover than in *A. microphylla,* so that the pericarp is completely hidden. Clos himself did not feel quite sure that his *A. glutinosa* was identical with Hooker's. The differences in the number of leaflets and pod-joints seem, however, to disappear on comparison. Another difference would be that the racemes end in a spine according to Hooker's description and type (a short and weak needle barely visible between the buds), being unarmed in Clos' plant. Whether or not the main axis terminates in a spine can not be found out without damaging the specimen, but in an undeveloped vegetative-floral branch the tip of a needle is seen.

Clos suggests that Colla's *A. arborea* is identical with *A. glutinosa,* but this is hardly possible, especially on account of "pedunculis axillaribus 1-floris folio brevioribus"; in *A. glutinosa* all the supporting leaves are reduced to bracts. Colla's plant came from the lowlands, while Clos' *A. glutinosa* is a montane species, found "en los llanos de Gantua, á 6000 pies de altura, y en otros puntos." Reiche (8, p. 126) quotes it from the Cordillera of Coquimbo at 2000 m. I suppose that the plains of Gantua are in the same range. His description is a combination of the original diagnosis and the description in Gay's Flora.

Clos mentions that he had seen specimens of *A. glutinosa* with leaves white with a dense tomentum. This form is matched by *Werdermann* no. *214,* collected in the cordillera of Río Turbio (Coquimbo) at 3000 m., Dec. 1929 (S), which may be described as follows:

It is a very spiny shrub with the cortex of the older branches deep

cinnamon-colored, and all the younger parts, including the inflorescence, very glutinous. Leaves 15–20 mm. long, densely tomentose on both faces, grayish green, generally 4- or 5-jugate, orbicular or broadly obovate, obtuse, thick and firm, 1.5–2.2 × 1.4–2.2 mm. Calyx 4.5–5 mm. long, with teeth 1.5–2 mm. long, densely glandular and glutinous; standard-limb 7 × 9, the claw 2.5 mm. long; wing-limb 5.5 × 3.6, the claw 3.5 mm. long; keel-limb 5.5–6 × 3.7 mm.; longer stamens 9–10, the shorter ones 7.5–8 mm. long; style 6.5 mm. long. This may be regarded as an alpine, more tomentose form. The pods are as in Gay's plant. FIGS. 11, 12, 17, 28.

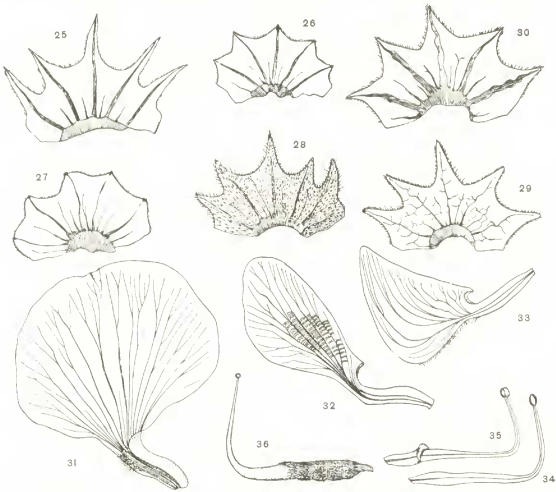

FIG. 2. 25–30. Calyces. *25. A. Berteroniana,* leg. *Grandjot. 26. A. microphylla, Skottsberg* no. *945; 27.* id., leg. *Skottsberg,* Zapallar. *28. A. glutinosa, Werdermann* no. *214; 29.* id., leg. *Grandjot. 30. A. Bedwellii, Skottsberg* no. *801.* 31–36. *A. Bedwellii: 31.* standard, *32.* wing, *33.* keel, *34.* longer stamen, *35.* shorter stamen, *36.* pistil.— All × 4.

More doubtful is another plant, collected by C. Grandjot in Sept. 1933 at Las Palmas de Pedegua, Prov. Aconcagua, alt. 650 m., and determined as *A. glutinosa*:

In general habit it resembles *A. microphylla;* the racemes and pedicels are shorter and the leaflets smaller than in *A. glutinosa,* but the glutinous pubescence, long calyx-teeth, and pod are as in the latter. Cortex dark violet-brown, more or less glossy. Leaves 10–15 mm. long, 3- or 4-, rarely

5-jugate, puberulous, dull green, the leaflets suborbicular to obovate or obcordate, 1–2 (–2.5) × 0.7–1.4 (–1.8) mm. Calyx 5–5.5 mm., the teeth 1.5–2.5 mm. long; standard-limb 7–7.3 × 9–9.5, the claw 2.7–3 mm. long; wing-limb 5.5–5.9 × 3.2–3.3, the claw 3.7–4 mm. long; keel-limb 6.7–6.9 × 4.2–4.3, the claw 3.5 mm. long; longer stamens 11, the shorter ones 9.5 mm. long; style 7.5 mm. With the material at hand I can find no good reason to separate this from *A. glutinosa*. Figs. 13, 14, 18, 29.

Adesmia Bedwellii sp. nov.

Frutex spinescens ramosissimus usque bimetralis, cortice cinereo. Rami nodulosi, nodulis (ramis valde abbreviatis) fasciculatim foliosis, superioribus elongatis foliosis et racemigeris. Folia 15–25 mm. longa, puberula, 3–5-, vulgo 4-juga; foliola distantia, lineari-spathulata vel anguste obovata, obtusa, subsessilia, sat tenuia nervis plus minusve conspicuis, 2.5–6.5 (vulgo 3–5) mm. longa et 1–2 (vulgo 1.5) mm. lata. Racemi 2–4 cm. longi, inferne foliiferi, dein bracteiferi, apice spinescentes, rhachide parce puberula sed non glandulosa, circ. 12-flori. Bracteae triangulares, 1 mm. longae, fuscae. Flores lutei rufo-striati. Pedicellus gracillimus, puberulus et plerumque glanduloso-scaber, glandulis lageniformibus glutinosus. Calyx late campanulatus, breviter pubescens, dentibus acutis 1.5–2 mm. longis. Vexillum limbo extus pubescente, 9–10 mm. longo et 10.3–12 mm. lato, ungue 3.5–4 mm. longo superne lanato; alae limbo 7.5–8.5 mm. longo et 4–4.5 mm. lato, ungue 4.2–4.5 mm. longo; carina limbo 6.5 mm. longo et 4.3–4.5 mm. lato, margine inferiore parce lanato, ungue 3.5–3.7 mm. longo. Stamina longiora 11.5–12 mm. longa, duo breviora nectarifera 9.5–10 mm. longa, anthera 0.5 mm. longa; ovarium 5 mm. longum, stylus 6.5 mm. longus. Legumen 20–25 mm. longum 4- vel 5-articulatum, dorso tomentoso-glandulosum, latere dense setigerum, setis 8–9 mm. longis ferrugineis albo-pilosis.

Chile: Prov. Coquimbo: Frai Jorge, alt. 200–300 m., frequens, *C. & I. Skottsberg* no. *801*, July 14, 1917 (Göteb., type; S). Figs. 15, 16, 30–36.

In his account of a visit to Frai Jorge, F. Philippi (7, p. 206) speaks of a spiny Adesmia, 1.5–2 m. high and very abundant, and adds that "although it is similar to *Adesmia arborea* Bert., the commonest kind of this vast genus near Santiago, its habit is quite different, and it may easily be a distinct species." Reiche, in his description of the vegetation of the landward slope of the Frai Jorge ridge, the same locality where no. *801* was collected, refers the shrubby *Adesmia* — and there is, as far as I know, only one kind in this district — to *A. microphylla* (9, p. 184). *Adesmia Bedwellii*, named in honor of the late Mr. F. Bedwell, owner of the Frai Jorge farm at the time of our visit, is closely related to *A. microphylla*, but differs in the much longer and narrower leaflets, glutinous pedicels, longer calyx-teeth, and larger corolla (this is, however, almost as large in the form of *A. microphylla* collected at Zapallar). From *A. glutinosa* it differs in the leaves, the lack of glands on the rachis of the raceme and calyx, and in the shorter bracts, which in *A. glutinosa* are from 1.5 to 3.5 mm. long and very narrow.

The glutinous glands in *A. glutinosa* and *A. Bedwellii* are bottle-shaped, many-celled secretory organs with a long, slender neck; in the herbarium specimens a yellow, glistening drop of the hardened resin is frequently

seen (FIG. 19). Morphologically, the setae on the pod are homologous with secretory organs, and in their young state rather like these, as seen from FIGS. 20–24.

LITERATURE CITED

1. BERTERO, C. List of the plants of Chile. Translated from the "Mercurio Chileno" by W. S. Ruschenberger. Am. Jour. Sci. and Arts 19: [*Adesmia*, p. 67]. 1831.
2. CAVANILLES, A. J. Icones et descriptiones plantarum 5. 1799.
3. CLOS, J. Leguminosas in Gay, C. Historia física y política de Chile. Botánica 2: 46–256. 1847.
4. COLLA, A. Plantae rariores in regionibus chilensibus a Cl°. M. D. Bertero nuper detectae. Mem. R. Accad. Sci. Torino 37: [Fasc. 1]. 1831.
5. HOOKER, W. J., and G. A. W. ARNOTT. The Botany of Captain Beechey's Voyage. [*Adesmia*, pp. 18–19. 1830; 55. 1832].
6. PHILIPPI, F. Catalogus plantarum vascularium chilensium. 1881.
7. ———. A visit to the northernmost forest of Chile. Jour. Bot. 22: 201–211. 1884.
8. REICHE, C. Flora de Chile 2. 1898.
9. ———. Grundzüge der Pflanzenverbreitung in Chile. Engler & Drude, Die Vegetation der Erde 8. 1907.
10. STEUDEL, E. T. Nomenclator botanicus. Ed. 2 [p. 27]. 1840.
11. WALPERS, W. G. Repertorium botanices systematicae 1. 1842.

BOTANICAL GARDEN,
GÖTEBORG.